

From ACARS to ATN/VDL Mode 2

Presented by Akhil Sharma

(Akhil.Sharma@sita.int)

Manager, AIRCOM Service Development

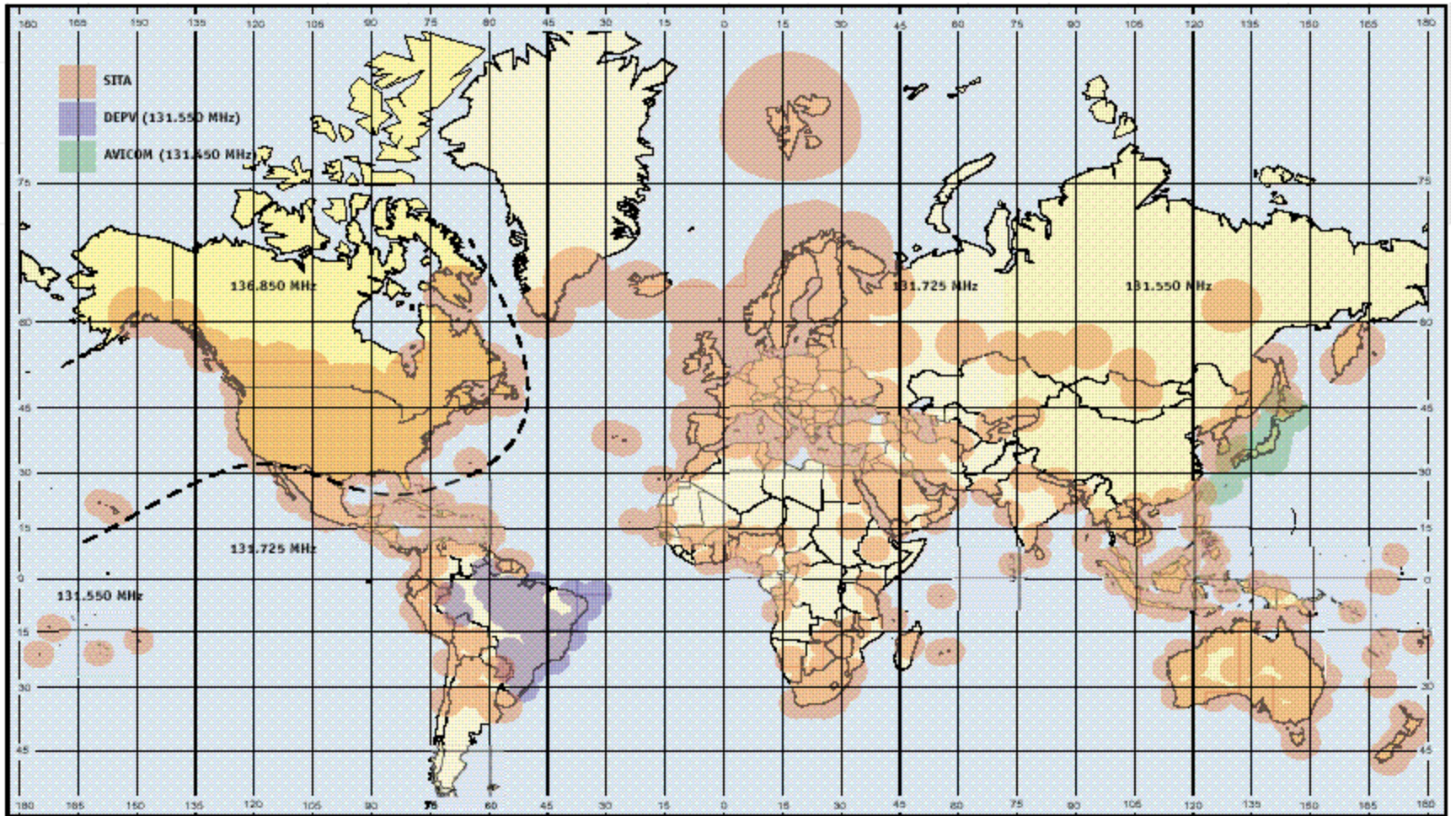
Introduction

- **SITA VHF AIRCOM Service was introduced in the mid 1980's to support AOC communications**
 - over 5,500 aircraft use the service today
 - **Satellite AIRCOM was introduced in the early 1990's to support AOC, AAC and APC**
 - over 1,200 aircraft use the service today
 - **Since the early 1990's, the VHF/Satellite AIRCOM Service has been increasingly used to support ATS communications**
 - over 20 ATS providers use the SITA ATS AIRCOM Service
 - **SITA has actively supported the development of ICAO ATN/VDL standards since the early 1990's**
 - **SITA is currently in the process of upgrading it's infrastructure to comply with ICAO ATN/VDL standards**
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Overview

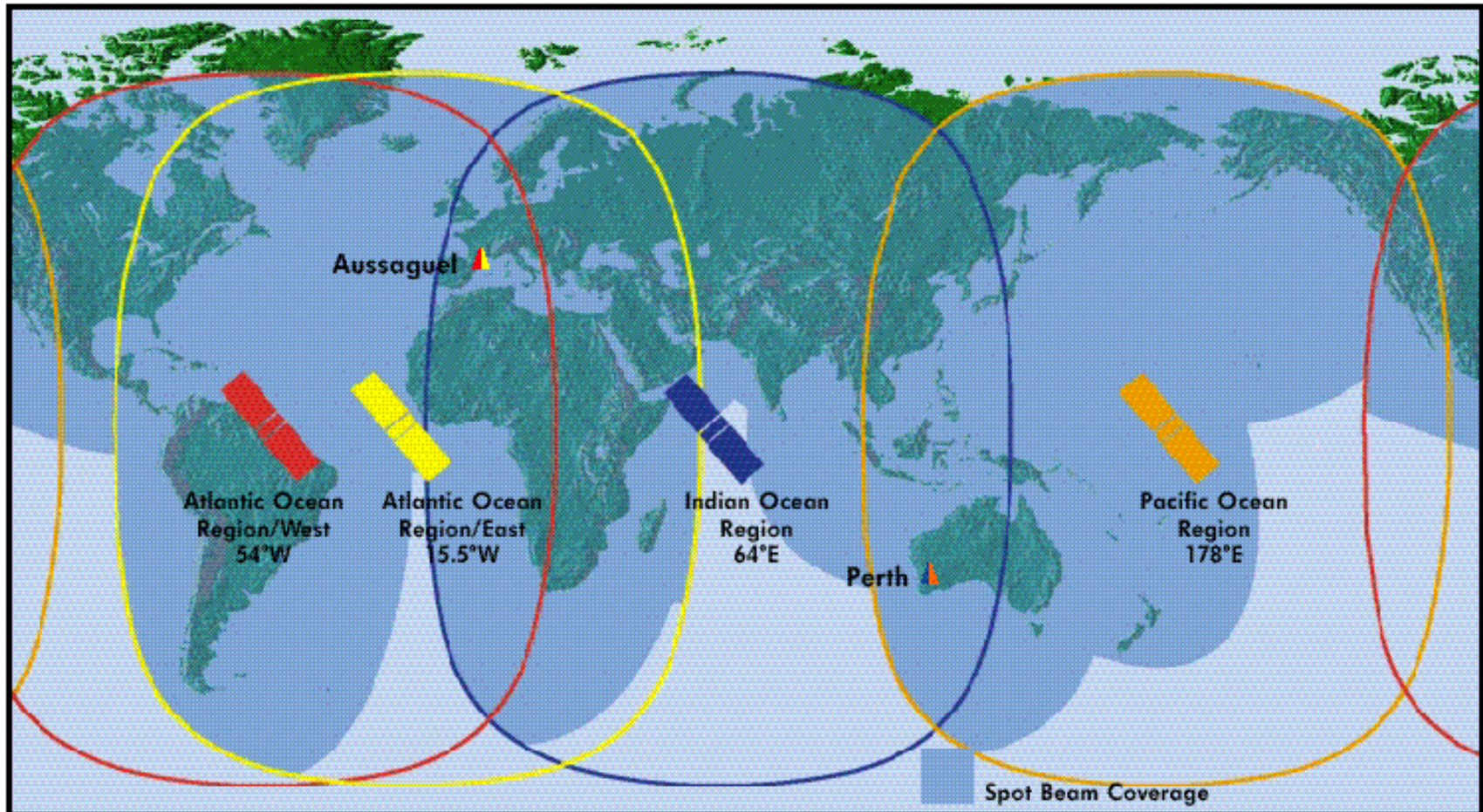
- **Current SITA AIRCOM Services**
 - VHF ACARS
 - SATCOM ACARS
 - Applications (ATS, AOC)
- **Future SITA AIRCOM Services**
 - VDL Mode 2
 - SATCOM
 - ATN
- **Transition - ACARS to ATN**

VHF AIRCOM Coverage



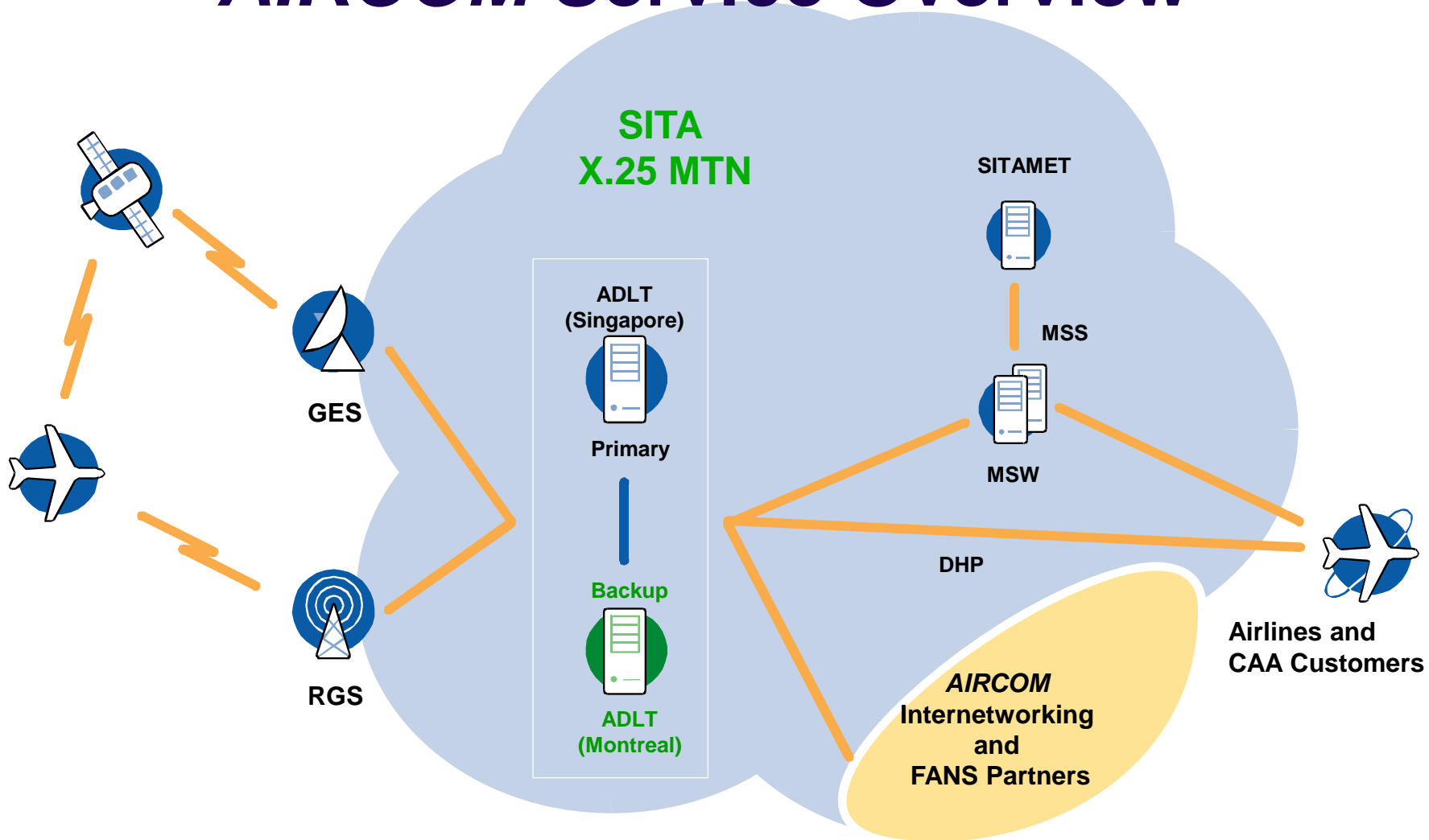
"CNS/ATM: Russia, 21 Century", July, 24-25, 2002, Magadan, Russia

Satellite AIRCOM Coverage



"CNS/ATM: Russia, 21 Century", July, 24-25, 2002, Magadan, Russia

AIRCOM Service Overview



AOC Use of ACARS

- SITA provides ACARS services for AOC to over 100 airline customers - The majority of these operate in MID region
- Since its deployment in 1985, SITA has seen dramatic increase in use
- 5,500 aircraft are VHF AIRCOM customers, of which an average of 3,000 use SITA services daily generating 400,000 messages per day
- Due to continued increases in demand for ACARS services in high traffic density areas (e.g. Europe, USA) continued performance shortfalls in the ACARS service are forecast
- Impact mitigated through additional en-route and airport frequencies - no more frequencies available
- Some airlines now withholding introduction of new applications
- Main driver for SITA's deployment of VDL Mode 2/AOA services

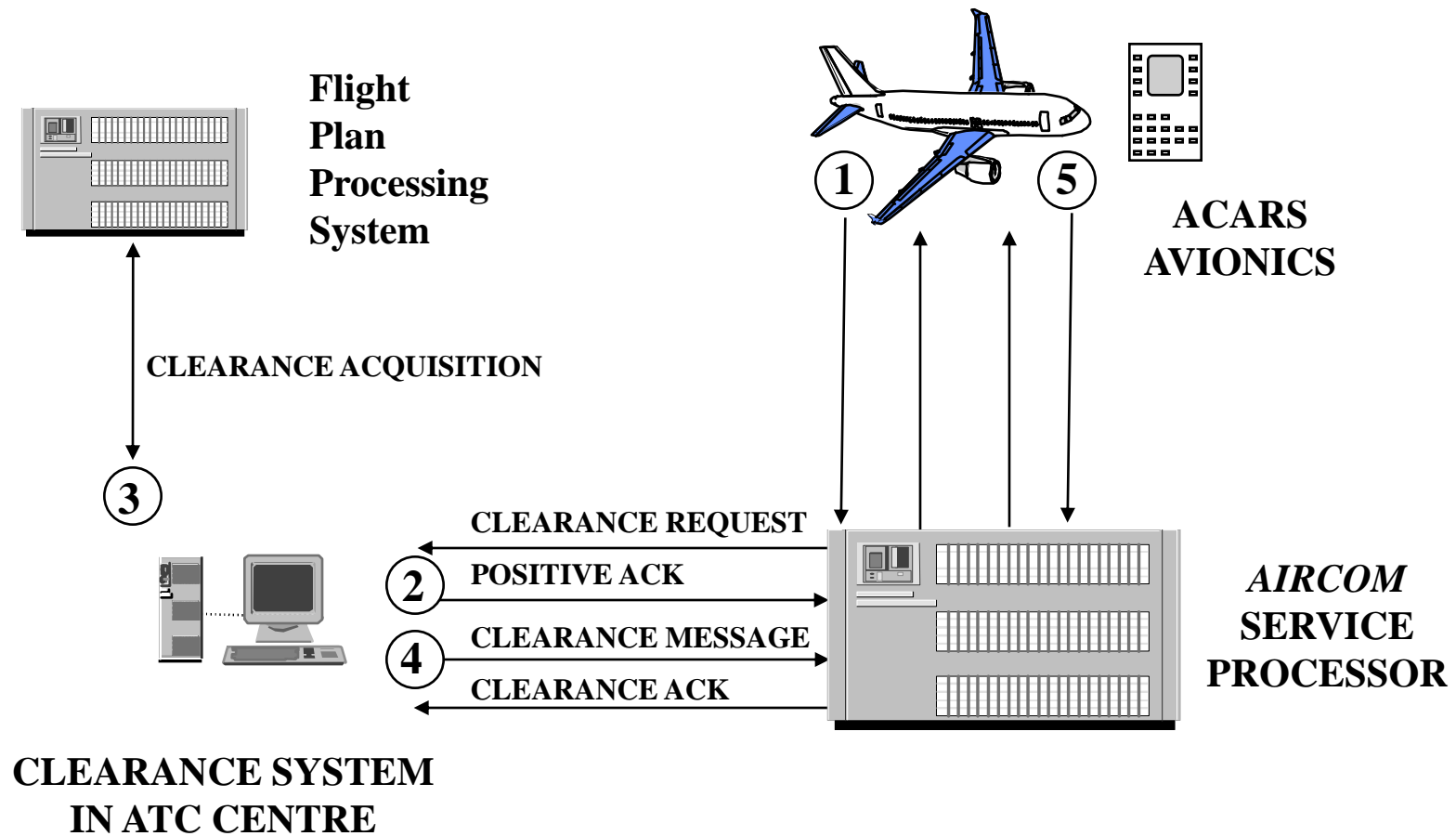
AOA - An Interim Step

- Industry has defined an interim step towards ATN
- Referred to as “AOA”, “ACARS over AVLC”
- With a relatively simple upgrade to Avionics and the SITA ACARS processor, AOA allows existing ACARS applications to benefit from the higher bandwidth offered by VDL Mode 2
- Does not require any change to the ACARS applications
- Transition from AOA to ATN/VDL Mode 2 will only require a software upgrade to the avionics
- An increasing number of airlines are planning to migrate to AOA for AOC purposes

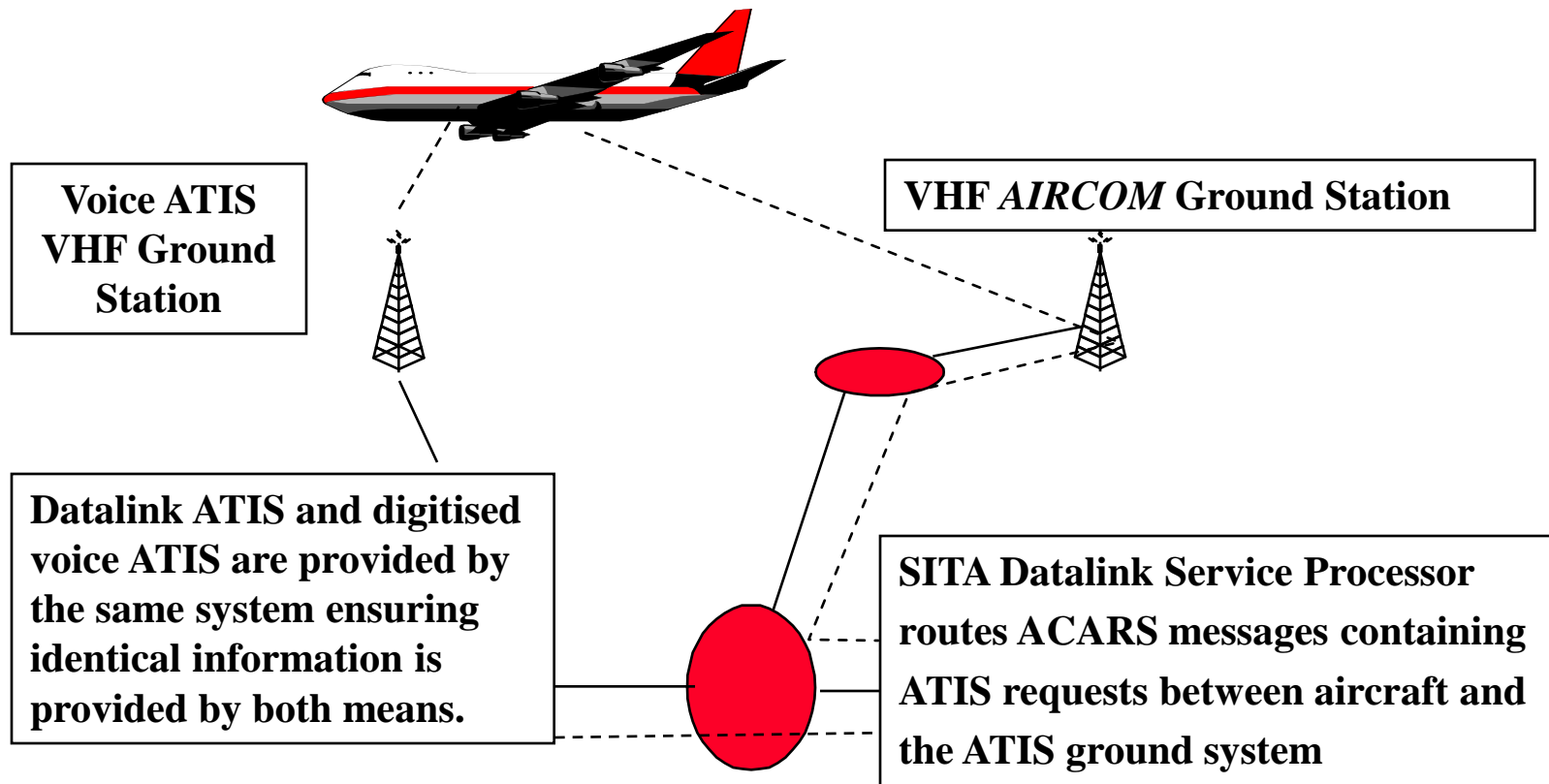
ATS Use of ACARS - Pre-FANS

- A number of ATS providers around the world have/are planning initial ATS data link services:
 - Departure Clearance (DCL), Oceanic Clearance (OCM)
 - Digital-ATIS (D-ATIS)
 - SITA provides DCL, OCM, D-ATIS services to:
 - Spain, ASECNA, Belgium, Bahrain, Singapore, Hong Kong, Korea, Portugal, Denmark, France, Switzerland, UK....
- SITA AIRCOM now offers a series of system solutions that implement D-ATIS and DCL services

AIRCOM Use for ATC Clearances



AIRCOM use for Digital ATIS



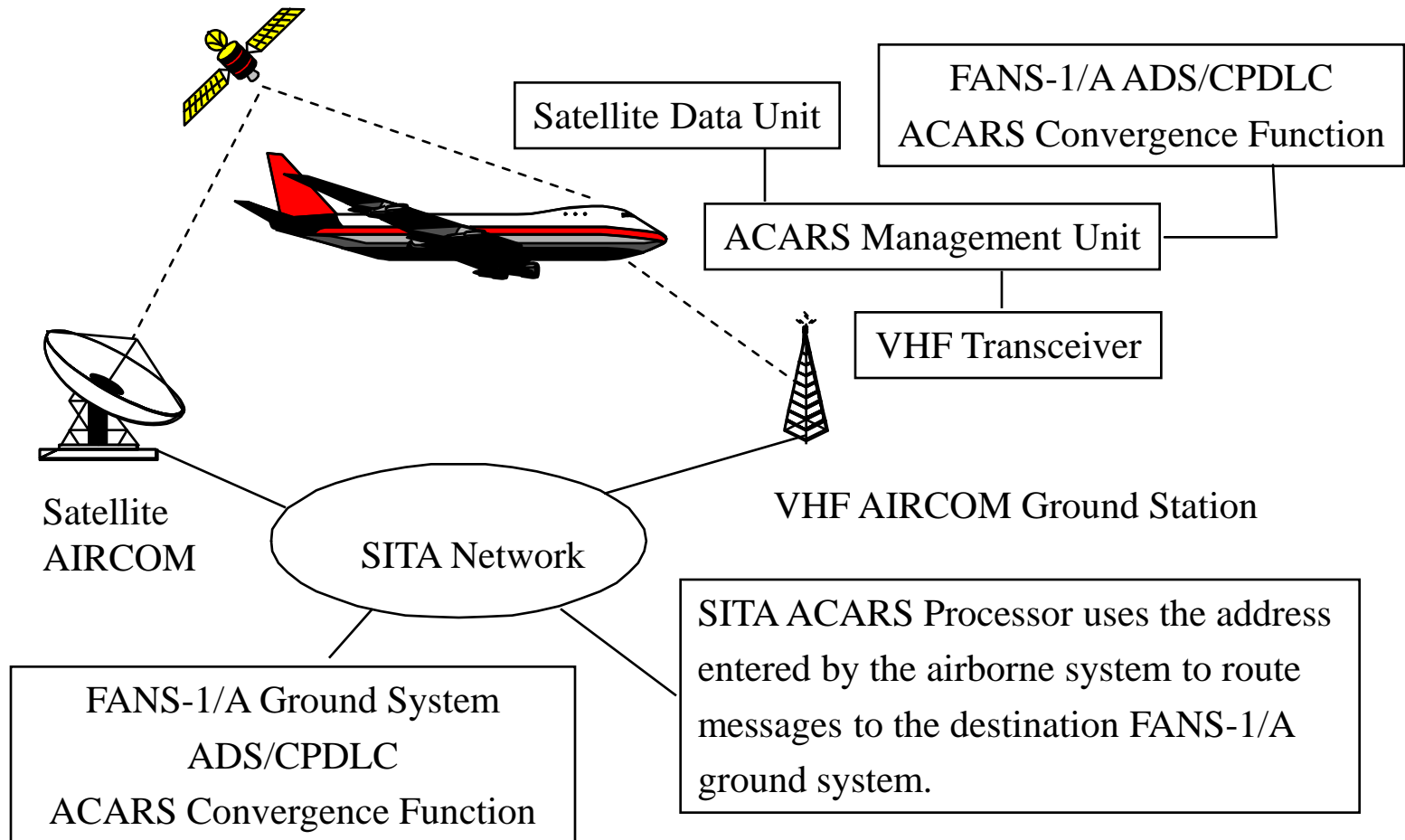
ATS Use of ACARS -FANS

- FANS 1/A implements ADS, CPDLC
- According to IATA estimates, there are approx. 1,200 FANS 1/A equipped aircraft today
- SITA currently provides FANS 1/A communications services to:
 - Eurocontrol, FAA, ATNS (South Africa), India (AAI), Sri Lanka, Spain (AENA), Fiji, Australia, Madagascar, Singapore, Hong Kong, Mauritius, Egypt, Korea, France.....
- Other regions, (Latin America, NAT) have concrete plans to introduce FANS 1/A services
- European States are looking at accommodating FANS 1/A equipped aircraft in domestic airspace where only ATN was originally planned

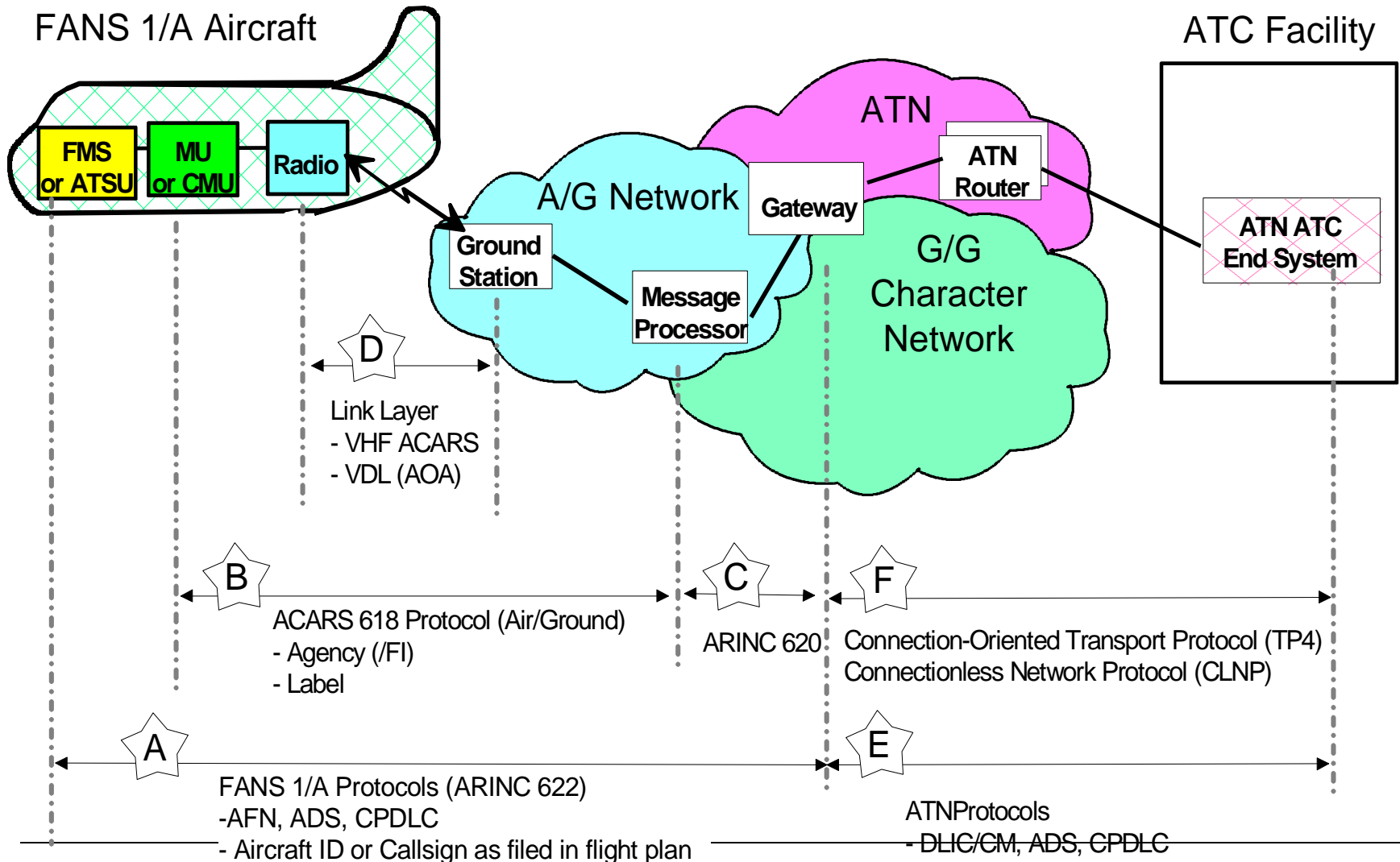
SITA FANS customers



AIRCOM use for FANS-1/A



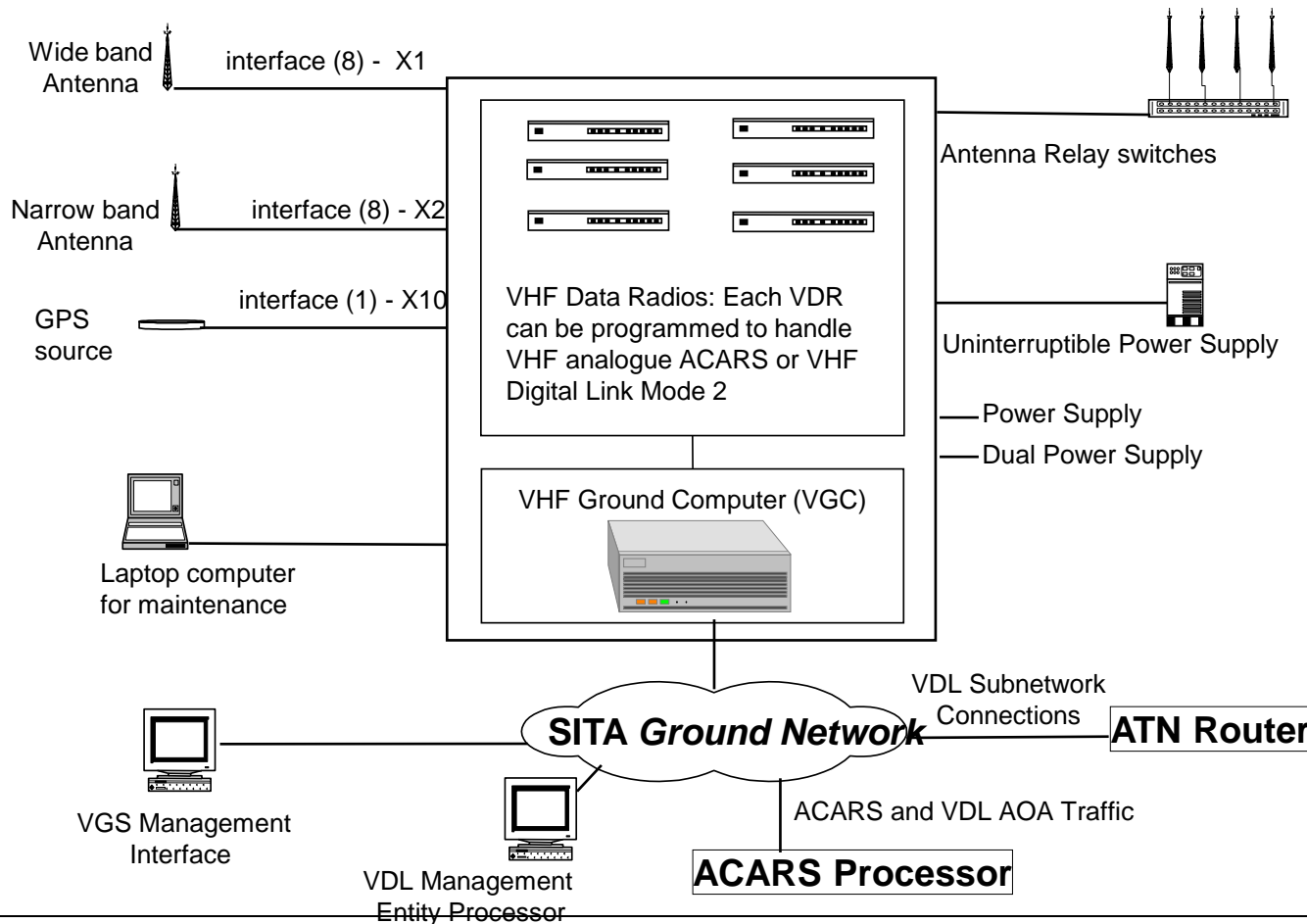
Domestic FANS 1/A with External Gateway



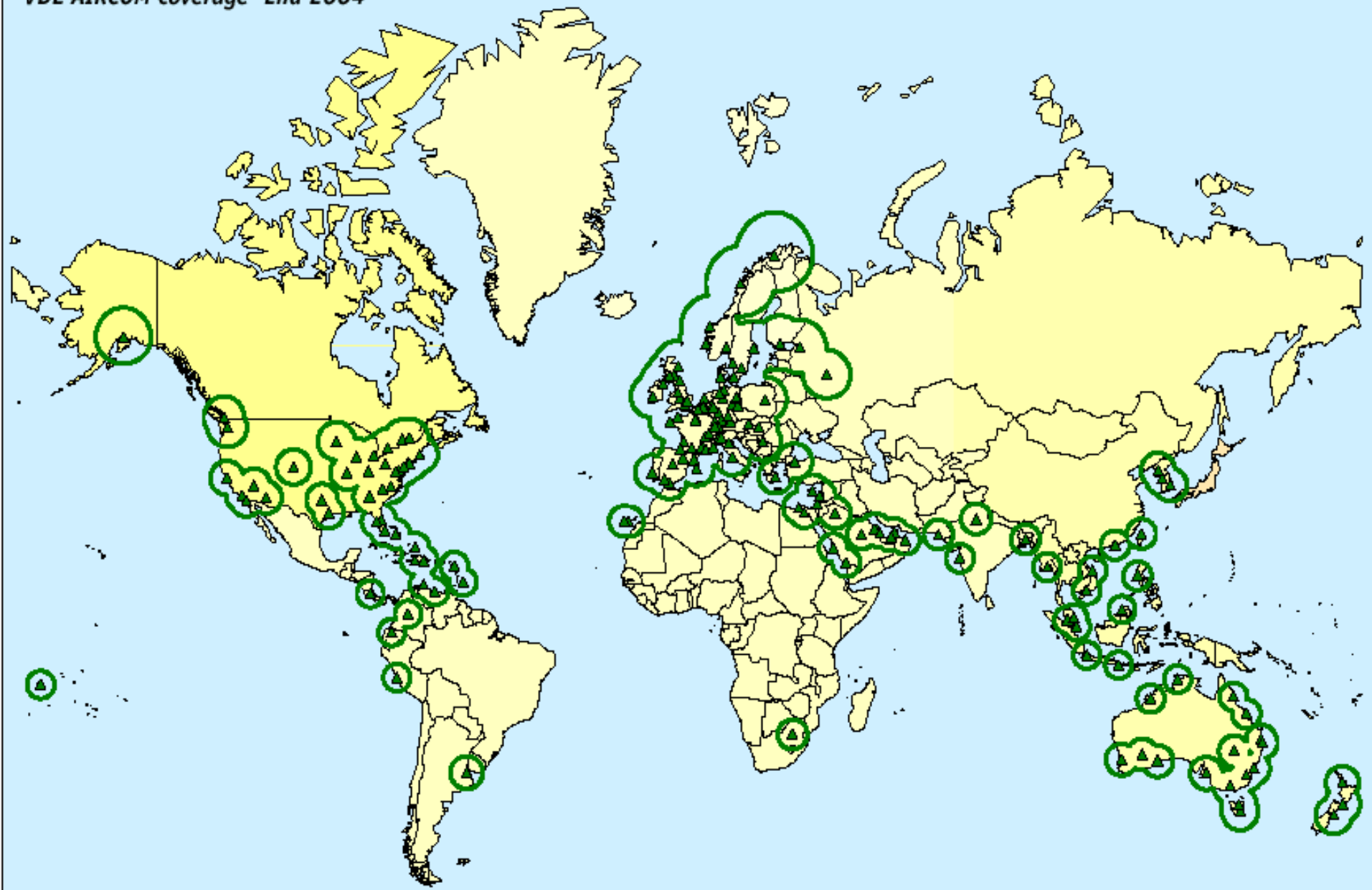
VHF ACARS to VDL transition

- VHF Digital Link Mode 2 service providing 10-20 times more capacity per channel than VHF ACARS.
- The airline business case to equip with VDL avionics is driven by the limitation of VHF ACARS capacity in the high density airspace of Europe and the USA
- Industry has defined the “ACARS over AVLC” (AOA) standard as a means to operate existing ACARS applications over the VDL 2 network
- To date, a number of airlines have stated their intent to implement AOA avionics
- SITA’s initial AOA service is planned to be launched in 2Q 2002 with a major European airline as the first customer
- The VGS (VDL Mode 2 and ACARS capable) has been delivered in October 2000 and deployment started beginning in January 2001
- VGS deployment rate is 60 - 80 sets per annum

SITA VGS Architecture



VDL AIRCOM coverage -End 2004



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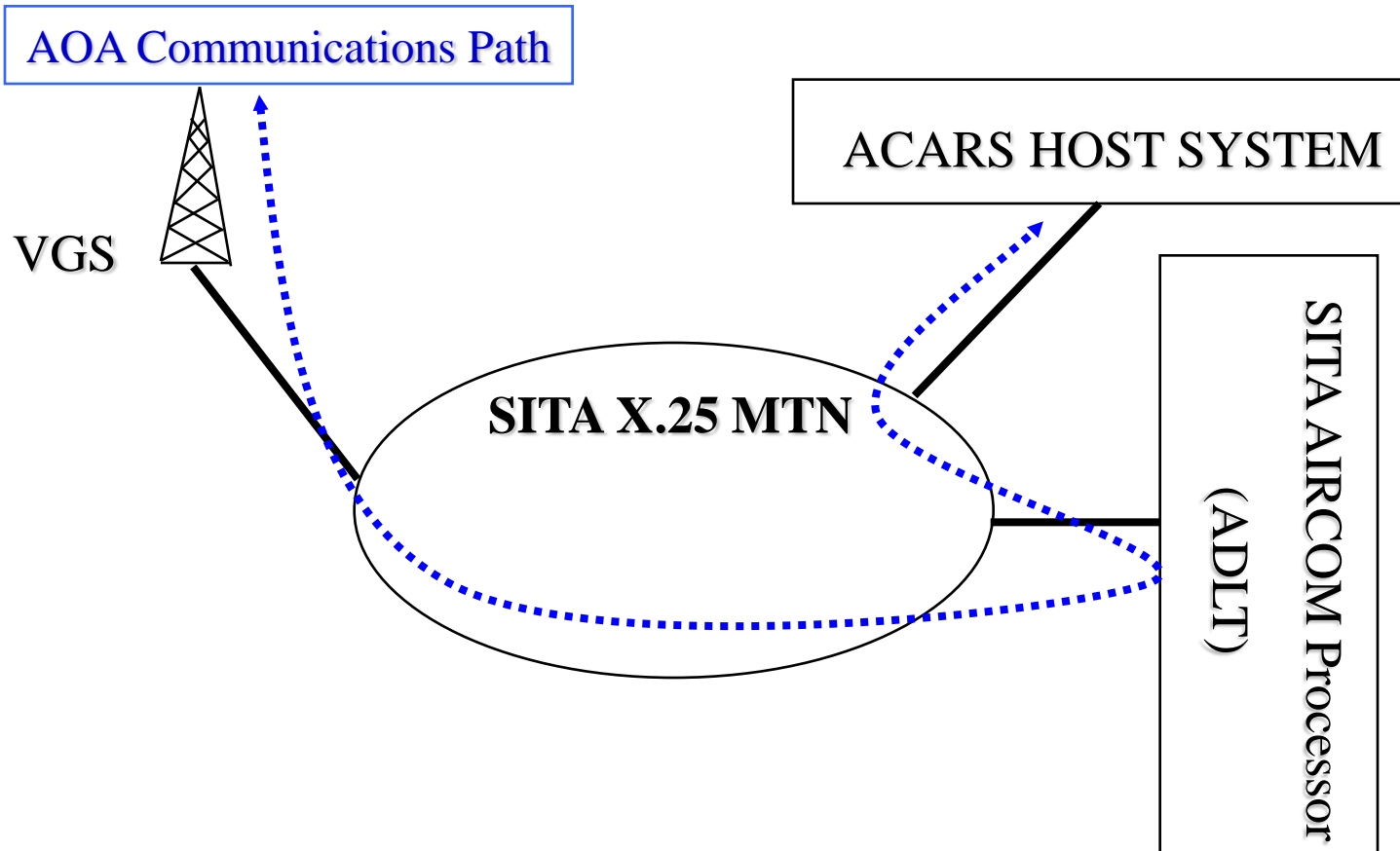
VHF AIRCOM in Russia

- SITA currently operates VHF AIRCOM Stations at:
 - Moscow (DME, SVO), Irkutsk (IKT), Khabarovsk (KHV), St. Petersburg (LED), Novosibirsk (OVB), Pertopavlovsk (PKC), Rostov (ROV), Ekateringburg (SVX), Yuzhno-Sakhalinsk (UUS), Vladivostok (VVO)
- These stations are used by over 60 airlines including:
 - Aeroflot, Lufthansa, Air France, KLM, British Airways, Korean Air, China East Airlines, SAS
- Additional stations are deployed, subject to approval, following requests from airline customers
- SITA is working with RF industry (Polyot) to facilitate development of VHF stations
- SITA is willing to partner with RF authorities to extend the VHF AIRCOM coverage to support ATS applications

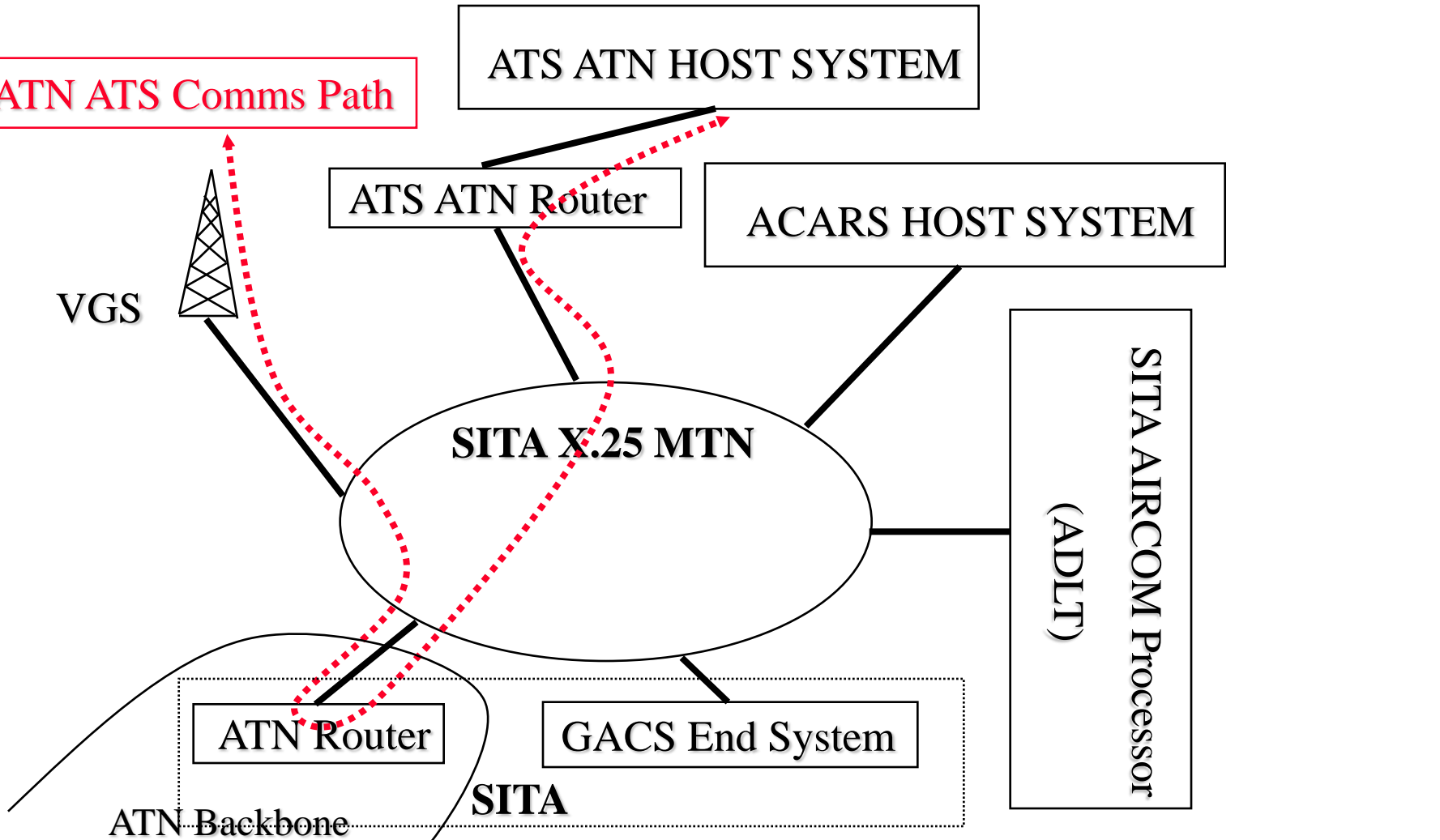
SITA ATN service

- **SITA's plans for ATN Service provision are driven by ATS provider requirements:**
 - FAA plans to launch CPDLC/ATN/VDLM2 service in September 2002
 - Eurocontrol Maastricht centre plans to implement CPDLC/ATN in September 2002
 - Eurocontrol's Link2000+ programme plans ATS datalink services from 2004 onwards
- **SITA's ATN service will be available from 2Q 2002**
- **SITA will also offer a "GACS" service which:**
 - permits legacy ACARS applications to use an ATN service
 - provides ATN interface for new binary (AOS & ATS) applications
- **The Satellite AIRCOM network and the new VGS ground stations will provide connections to aircraft ATN routers**
- **SITA willing to work/partner with RF ATS providers to determine/support plans and trials for ATN service provision**

AOA Communications Path



ATN ATS Communications



Conclusion

- **SITA is committed to supporting world's Air Traffic Service providers in their transition towards the introduction of ICAO compliant datalink communications services**
- **As an interim step for the RF, SITA recommends the introduction of initial ATS datalink services over ACARS, e.g. D-ATIS, DCL services**
- **SITA also recommends the expansion of FANS 1/A services in the RF to accommodate the increasing numbers of FANS 1/A aircraft**
- **SITA is willing to support the execution of ATN/VDLM2 trials in the RF**
- **SITA is willing to enter into partnership agreements with RF authorities to facilitate the introduction of ATS datalink services (over ACARS, ATN/VDL Mode 2) across the entire region**

Thank you for your attention



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